CLAIMS

We claim:

1. A method for performing a medical test associated with glaucoma comprising

displaying a plurality of visual stimuli for observation by one eye of a patient;

detecting the patient's evoked brain potentials in response to said stimuli through one or more electrodes attached to the patient's scalp;

recording said evoked potential signal detected for each stimulus displayed;

performing an automatic digital signal processing for a plurality of said recorded evoked potential data following the recording; and

displaying an indication of whether there is a high or low likelihood of glaucoma on a computer monitor based on said digital signal processing.

2. The method of claim 1 wherein

the visual stimulus is composed of two patterns, an isolated check pattern and a uniform field pattern, displayed alternatively in a periodic manner at a frequency of about twelve Hertz.

3. The method of claim 1 wherein

the data recording comprises

amplifying said visual evoked potential signals detected from said one or more electrodes attached to the patient's scalp;

converting said visual evoked potentials amplified from analog signals to digital signals.

4. The method of claim 1 further comprises

an automated procedure for evoked potential recording and digital signal processing;

wherein

a computer processor controls both said evoked potential recording and said digital signal processing; and

the computer processor initiates said digital signal processing immediately following the completion of said evoked potential recording.

5. The method of claim 1 further wherein

the digital signal processing comprises

performing a Discrete Fourier Transform on a plurality of the data recorded to obtain a plurality of fundamental frequency components of a plurality of the data items corresponding to the periodic visual stimuli;

performing a multivariate statistical method to determine a signal-to-noise ratio for said plurality of fundamental frequency components;

comparing said signal-to-noise ratio with a preset critical value; and

determining if the likelihood of glaucoma is high or low based on said comparison.

6. The method of claim 5 wherein

the multivariate statistical method is a T^2_{circle} method.

7. An apparatus for performing a medical test associated with glaucoma comprising

a computer processor;

a visual stimulus generating device for presenting visual stimuli to a patient;

a visual evoked potential recording and measuring device;

a computer monitor; and

a computer memory; wherein

the computer processor is programmed by computer software residing in the computer memory to:

display a set of visual stimuli on said visual stimulus generating device for observation by a patient;

control said recording and measuring device to record a plurality of visual evoked potential signals in response to said set of visual stimuli detected from one or more electrodes attached to the patient's scalp;

perform digital signal processing on the data recorded; and

displaying an indication of whether there is a high or low likelihood of glaucoma on said computer monitor based on said digital signal processing.

8. The apparatus of claim 7 wherein

the visual stimulus generating device is comprised of a graphics card and a video monitor.

9. The apparatus of claim 7 wherein

the set of visual stimuli is composed of two patterns, an isolated check pattern and a uniform field pattern, displayed alternatively in a periodic manner at a frequency of about twelve

Hertz. The frequency of the stimulus and the sequence to display each stimulus is controlled by said computer software.

10. The apparatus of claim 7 wherein

the visual evoked potential recording and measuring device comprises

an amplifier that enlarges the visual evoked potential signals detected from one or more electrodes attached to the patient's scalp;

an A/D converter that converts said amplified visual evoked potential signals to digital signals, and provides said digitized signals to the computer processor. The digital sampling rate of said A/D converter is controlled by said computer processor.

11. The apparatus of claim 7 further wherein

the digital signal processing comprises

performing a Discrete Fourier Transform on a plurality of the data recorded to obtain a plurality of fundamental frequency components of a plurality of the data items corresponding to the periodic visual stimuli;

performing a multivariate statistical method to determine a signal-to-noise ratio for a plurality of said fundamental frequency components;

comparing said signal-to-noise ratio with a preset critical value; and

determining if the likelihood of glaucoma is high or low based on said comparison.

12. The apparatus of claim 11 wherein

the multivariate statistical method is a T^2_{circle} method.